

Hysteroscopic treatment of symptomatic isthmocele: experience of a tertiary referral centre in Romania

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Abstract

Background: This is a retrospective study from a tertiary referral center in Iasi, Romania, made between January 2017 and December 2019. We included all patients with isthmocele managed by hysteroscopy in our hospital on whom we found complete medical data.

Aim: To describe symptoms before and after hysteroscopic surgery of isthmocele.

Methods: We recruited in our study seven patients in whom the diagnosis of isthmocele was confirmed by 2D transvaginal ultrasound. The following data were collected: patient characteristics, history and symptoms before surgery, description of isthmocele and patient outcome after hysteroscopic resection of isthmic anterior wall. The main indications for surgery were abnormal uterine bleeding (7/7), pelvic pain (3/7) and secondary infertility (1/7).

Results: None of our patients had postoperative complications. The follow up duration was between 12 months and 36 months. Symptoms were significantly improved after hysteroscopy in all seven patients with abnormal uterine bleeding and in 2 of 3 patients complaining with pain. One of our patients wished to conceive and she obtained a pregnancy by in vitro fertilization, finalized with a miscarriage in the first trimester because of chorioamnionitis.

Conclusion: hysteroscopy is an effective technique for the main complications of isthmocele, with a high satisfaction rate among treated women.

Key Words: Caesarean scar, Abnormal uterine bleeding, Hysteroscopic resection, Transvaginal ultrasound

Introduction

With the increasing rate of caesarean sections especially in developed countries, there is also a rise in incidence of short and long term complications. Recent studies suggest that in Romania, the CS rate is more than 50% in public maternity hospitals from urban areas (1). Isthmocele or caesarean scar defect (CSD) is caused by impaired wound healing of the caesarean section scar consisting in a total or partial damage of the endometrial and sometimes muscular layer of the anterior uterine wall (2), leading to an indentation with a deepness ≥ 2 mm (3). First described by Morris in 1995 (4), isthmocele usually appears on ultrasound as a triangular anechoic image on the anterior uterine wall, at the level of the uterine incision (5). Regarding its shape, in the last years the niche was classified in simple, simple with one branch and complex (with at least two branches) (3). Its prevalence varies

between 24 and 80% using TVUS, with a higher incidence of 56-84% when performing SHG (6). Being a relatively new condition, there is no consensus on best management. Diagnosis can be delayed by misinterpretation of findings when ultrasound is performed during a phase of menstrual cycle, when having an empty uterine cavity. Treatment also remains challenging, especially because of the impact of a thin uterine scar on further obstetrical outcome.

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In this article, we present a case series of postcesarean uterine niches treated by hysteroscopy in our institution, reporting on clinical and sonographic features that led to the decision of surgical intervention. Our study can contribute to improve the management of isthmocele.

Materials and methods

This retrospective study was designed to assess the clinical outcome of uterine niche before and after hysteroscopic surgery. The study was initiated at Cuza-Voda Hospital in Iasi, a tertiary referral center for pregnancies, with annual rates of more than 3000 caesarean sections. The study was approved by the Ethics Committee of Cuza-Voda Hospital. All patients completed an informed consent to participate to the medical studies.

Symptomatic women with history of several months of abnormal uterine bleeding, pelvic pain and at least one CS, who underwent hysteroscopic isthmocele excision in our unit were included into the study. Only patients with a residual myometrium thickness of ≥ 2 mm on transvaginal ultrasound were considered eligible for the intervention.

Detailed menstruation pattern and obstetric and gynaecologic history were obtained in the hospital and included in medical files. We considered postmenstrual spotting as brown discharge for more than 2 days after menstruation and we also noted presence of periods of more than 7 days, association of dysmenorrhea, dyspareunia, chronic pelvic pain or postcoital bleeding. We also included in the electronic medical records database the age, current medication and contraceptive method, smoking habits and alcohol consumption, BMI and any other medical conditions that could change bleeding profile. Postoperative information was collected by telephone interview.

All women were assessed by experienced gynaecologists who evaluated the uterus and niche by TVUS before surgery by performing clinically relevant measurements in sagittal and transverse plane. We used IC5-9-D transvaginal 5 MHz probe (Voluson E8; GE Healthcare Austria GmbH & Co OG) to assess the length, depth and width of the pouch taking the highest values, according to Jordans et al.(3). As we had only simple niches, without branches, for remnant myometrial thickness (RMT) we selected the smallest value of the main pouch, and for all measurements we excluded the endometrium. Before surgery, five patients in our study had previous treatments with progesterone pills for at least 3 months and they were unsatisfied because they did not remark a significant change in their bleeding pattern. The other two patients refused hormonal treatment because of fear for adverse symptoms, especially weight gain. We counselled only symptomatic patients that had an isthmocele height of at least 2 mm and also the isthmic smallest myometrial thickness of more than 2 mm to do the hysteroscopic procedure.

The intervention was performed by two gynaecologists with skills in operative hysteroscopy and was scheduled between day 5 and 10 of menstrual cycle under general anesthesia. After using the Bettocchi 5 mm hysteroscope (Karl Storz; 26120 BA) for a complete diagnostic hysteroscopy, we dilated the cervix till 9 mm in order to introduce a 9 mm bipolar resectoscope (Karl Storz; 26050 SC). After distending the uterine cavity with saline solution, we resected the proximal and distal margins of the scar and after that we coagulated the bottom/ground of the scar with coagulation bipolar electrode with ball end. After that, we reduced the pressure in the uterine cavity to verify the haemostasis and to see the new appearance of the defect. We had no intraoperative complications. After the procedure, the patient remained in the hospital for surveillance till the next day.

Results

Seven patients with symptoms that were attributed to isthmocele and who met the inclusion criteria underwent hysteroscopic excision of the niche at Cuza Voda hospital Iasi between 2017 and 2019. Table 1 presents individual clinical characteristics of our study population. Table 2 presents patient summarized clinical and sonographic characteristics before hysteroscopic excision of isthmocele. The main age of patients is 36 (33-42 years). The median number of CS is 1.7 (1-3). All patients had abnormal uterine bleeding (all had postmenstrual spotting and of these, 1 also had menorrhagia), 3 of them described pelvic pain (2 chronic pelvic pain and 1 dyspareunia). Only one of our patients wished to conceive before surgery, so we couldn't investigate fertility outcomes related to correction of isthmocele. She was satisfied about improving of gynaecological symptoms and declared absence of postmenstrual spotting after surgery. She obtained a twin pregnancy by IVF, which resulted in a miscarriage at the end of the first trimester because of chorioamnionitis.

Table 1. Clinical, demographic and sonographic characteristics of the patients included in the study and symptoms after surgery

Patient	Age (years)	G	P	Previous CSs	M	Symptoms	Isthmocele dimensions on TVUS(mm) base/depth/length	RMT (mm)	Symptoms after hysteroscopy
1	37	2	2	2	0	spotting for whole month, chronic pelvic pain in the last 6 months	16.5 10.1 27.2	4.5	No spotting, no chronic pelvic pain
2	35	1	1	1	0	7 days of spotting	5.4 8.7 14.3	6.5	No spotting
3	38	6	2	2	4	spotting for 2-3 weeks, dyspareunia,	8.5 3.5 14.0	4.9	No spotting, dyspareunia remained
4	35	3	2	2	1	Spotting 4 days after menstruation, in the last 3 years	16.1 5.2 10.3	5.2	No spotting
5	33	4	3	3	1	Menorrhagia for 3 days, spotting for whole month, chronic pelvic pain, all for the last 6 months	6.1 4.2 9.1	4.7	No spotting, no chronic pelvic pain
6	33	3	1	1	2	Spotting 7 days, infertility for the last 3 years	11.3 6.4 10	5.5	No spotting, IVF twin pregnancy resulting in a miscarriage
7	42	1	1	1	0	Spotting for 2 weeks in the last 8 months	7.2 5.5 8.9	6.1	No spotting

G – gestation; P – parity; CSs – caesarean sections; M – miscarriages; B – base; D – depth; L – length; RMT – remnant myometrial thickness; TVUS - transvaginal ultrasound.

Table 2. Patient summarized clinical and sonographic characteristics before hysteroscopic excision of isthmocele

Characteristics	Median(min-max)	Nr.(%)
Age	36 (33-42)	
Gravidity	2.8 (1-6)	
Parity	1.7 (1-3)	
Nr. of CSs	1.7 (1-3)	
AUB		
- Postmenstrual spotting		7 (100%)
- Menorrhagia		7 (100%)
Pelvic pain		
- Chronic pelvic pain		1 (14.2%)
- Dysmenorrhea		
- Dyspareunia		
Infertility		
		3 (42.8%)
		2 (28.5%)
Isthmocele sizes (mm)		
		0 (0%)
- Height		1 (14.2%)
- Width(base)		
- Length		
RMT		
		1 (14.2%)
	6.2(3.5-10.1)	
	10.1(5.4-16.5)	
	13.4(8.9-27.2)	
	5.3(4.5-6.5)	

AUB – abnormal uterine bleeding, RMT – remnant myometrial thickness, CSs – caesarean sections

The preoperative sonographic characteristics of isthmocele are described in table 1. We had a median depth of 6.2 mm, width of 10.1 mm, length of 13.4 mm and a median RMT of 5.3 mm. **Figure 1** shows the sonographic findings of one of the patients included in our study, which appears as an anechoic area located on the anterior isthmic

wall. After isthmoplasty, she was counselled to perform an ultrasound, which revealed an anterior wall with a little, regular indentation, without the pouch-like aspect. **Figure 2** shows hysteroscopic appearance of the pouch, with coagulated blood evacuating from the defect, giving the spotting defining for this condition.

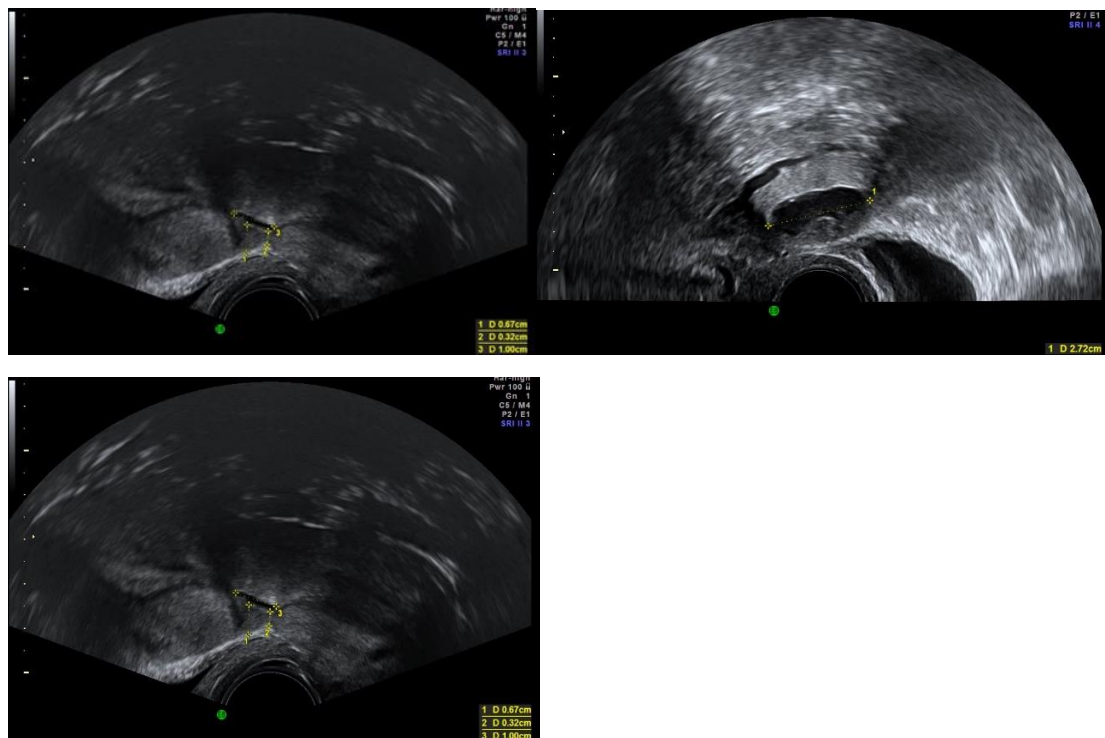


Figure 1. Ultrasound of isthmocele showing anechoic area in the anterior isthmic area; a) sagittal plane, b) transverse plane, c) after hysteroscopic isthmoplasty

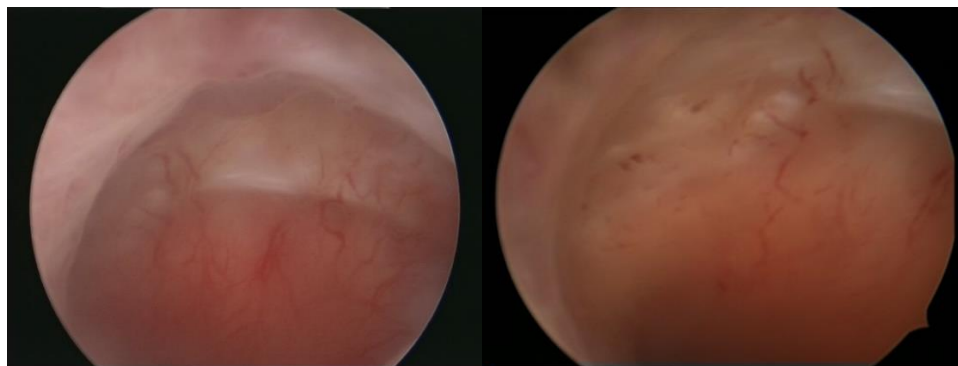




Figure 2. a,b,c - aspect of isthmocoele on hysteroscopy, showing indentation of anterior uterine wall and multiple orifices through which coagulated blood is externalized

All the patients reported improvement of their menstrual pattern. Among those with postmenstrual spotting, the number of days reduced with more than 50% from the month following the intervention. After more than 12 months from isthmoplasty, all of them declared absence of spotting. The patient with menorrhagia didn't experience a reduction in number of days of bleeding but a significant decrease of menstrual flow, having the same pattern as before CS. Regarding women with pelvic pain, surgery was successful for 2 of them. The two patients with chronic pelvic pain declared improvement of symptoms, but that with dyspareunia declared no change of pain intensity. All patients were satisfied with the hysteroscopy and observed total or partial improvement of symptoms.

Discussion

The increasing rate of CS in the last decades led to underrecognized long term complications related to impaired healing of uterine scar (7). Awareness of scar defect existence made treatment modalities of symptomatic isthmocoele a major interest topic. Knowing when to treat and also finding the best treatment technique for different types of niches still remains a challenge. Among treatment options, medical management with systemically administered progesterone or estro-progestatives or with insertion of levonorgestrel-releasing intrauterine system (LNG-IUS) devices is the first step.

Considering that different studies have found discrepant results of hormonal therapy efficiency, minimally invasive surgical techniques are the further step in assessing symptomatic niches. Since Fernandez in 1996 (8) and Fabres in 2005 (9), first proposed removal of scar tissue to allow blood evacuation from the pouch a lot of surgical excisional methods were described, including laparoscopic or vaginal approach, and also hysteroscopic-laparoscopic or vaginal-laparoscopic combinations(10)(11). Hysteroscopy is a minimally invasive surgical technique, very adequate especially for patients with AUB, which experience a postprocedural important decrease in number of bleeding days, leading to a high satisfaction rate (7). It is

well accepted by patients because of short recovery period, which leads to early work reinsertion.

It has the advantage of direct visualisation and assessment of postcesarean niches and in experienced hands it is associated with low morbidity. Studies described various techniques, from coagulation of dilated vessels of the bottom of the niche to resection of upper, lower or both edges of the isthmic defect (13),(14),(15). All these therapeutic options require approach and coagulation of the affected vessels of the bottom of the pouch, which prevents menstrual blood retention and allows its faster elimination. Literature shows many definitions for isthmic niche and also different indications for hysteroscopic treatment regarding the minimum residual myometrial thickness for minimizing the risk of bladder injury during procedure and also the risk of uterine rupture in labour in a subsequent pregnancy. Some authors considered 2.8 mm is out of risk (16), others concluded that 2.5 mm is enough for a safe vaginal birth, meantime others establish the safety limit at 2.0 mm(17).

In this study, we assessed the efficiency of hysteroscopy for improving symptoms in women with postcesarean section scar defect. TVUS allowed us correct diagnosis of isthmocoele with high accuracy and characterized the presence, size, shape of the pouch, RMT and relationship between the niche and bladder wall. We enrolled in our study patients with minimum RMT of 2.0 mm, according to this information. Our technique involves resection of proximal and distal border of the defect and also cauterization of the inflamed bottom of the niche, but not resection of it, in order to preserve isthmic thickness and to allow dark haematic material collected into the scar defect after menstruation to eliminate faster, avoiding the slow drainage and the dark discharge for many days (13). Correct treatment also can help improve fertility, as the content of the pouch can maintain local inflammation and negatively affect sperm and embryo implantation (18,19).

Limitations

Our study includes only seven patients, a small number that prevents us from having a statistic and drawing any final conclusion. This is due to patient refusal of any surgical intervention when they understand that uterine bleeding is due to a benign disorder. Also, the postoperative follow-up was not unified and the patients were evaluated by anamnesis, without ultrasound assessment. They were not examined repeatedly, and conclusions regarding early and late postoperative symptoms couldn't be formulated. Regarding treatment influence on infertility, we couldn't evaluate this because only one of our patients did wish to conceive and obtained a twin pregnancy by IVF, ended in a late first trimester miscarriage.

Conclusion

Hysteroscopy is an efficient mini-invasive treatment for symptomatic isthmocele. Our seven patients study results suggest that, respecting certain inclusion criteria, the resection of the edges of the defect and coagulation of its bottom allow the elimination of menstrual blood and secretions, reducing subsequent symptoms like pain and abnormal uterine bleeding. Overall patient satisfaction after surgery is high, taking into account the improvement in symptomatology and also the rapid recovery and social reinsertion. Being a large spread and relatively new affection related to increased number of caesarean sections in the last years, a study on a larger group of patients and a detailed postoperative assessment would be useful for a correct statistical analysis.

Conflict of interest

We declare no conflict of interest concerning this manuscript, including any financial, personal or other relationships with other people or organizations that could influence our work.

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